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Entrepreneurs innovation bringing job satisfaction, work-family balance, and life satisfaction: In China and around the world

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ABSTRACT

Entrepreneurs work such, as innovation, may bring financial benefits and non-pecuniary benefits, such as well-being. Entrepreneurial innovation expectedly benefits an individuals job satisfaction, balance between work and family, and life satisfaction. This is tested for entrepreneurs in China and around the world, with a globally representative sample of 33,519 entrepreneurs, including 786 in China. Among entrepreneurs around the world, innovation benefits job satisfaction, the balance between work and family, and life satisfaction. In China, specifically, entrepreneurs innovation also benefits their satisfaction with the balance between work and family and with life.

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1. Introduction: innovation and life satisfaction

Ever since the early innovation studies, such as by Schumpeter (1983), the focus has been on the economic rents from innovation for an individual, for a firm, and for a society. A new line of studies, particularly in the field of social entrepreneurship, has increasingly attended to the non-pecuniary benefits from innovations that aim at contributing to the well-being of people by fulfilling their needs (Dacin, Dacin, & Matear, 2010; Eizagirre, Rodríguez, & Ibarra, 2017; Jauhiainen & Hooli, 2017). These studies similarly invoke non-pecuniary and sometimes even altruistic motives behind entrepreneurial activity. Therefore, might it be that entrepreneurs innovation also brings them non-pecuniary benefits in the form of satisfaction?

Several recent studies mark an increased interest in the psychological outcomes from entrepreneurial endeavors, such as psychological well-being (Uy, Foo, & Der and Song, 2013), perceived quality of life (Tobias, Mair, & Barbosa-Leiker, 2013), job-satisfaction (Millán, Hessels, Thurik, & Aguado, 2013), and entrepreneurial satisfaction (Carree & Verheul, 2012). The examination of such psychological outcomes and their antecedents is important because life satisfaction is associated with many outcomes in the lives of individuals, including health, personal income, longevity, citizenship, and social relationships (Diener, Oishi, & Lucas, 2015). Studies have also revealed positive effects from individual happiness and work satisfaction on several aspects of individual work performance (Cropanzano, Cropanzano, & Wright, 2001), work unit performance (Harter, Schmidt, & Keyes, 2003), and firm performance (Van De Voorde, Paauwe, & Van Veldhoven, 2012; Wood, Veldhoven, Croon, &

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Menezes, 2012). Such findings intensify the economic interest of policy makers across the globe in exploring the antecedents to the life-satisfaction of entrepreneurs as a potential engine for economic growth.

Most studies find entrepreneurs to be more satisfied with life than people who are employees (Millán et al., 2013; Schjoedt, 2009). Several studies have explained the higher life satisfaction of entrepreneurs by the fact that entrepreneurship provides particularly good conditions for the fulfillment of individuals basic psychological needs for competence, relatedness, and autonomy (Carree & Verheul, 2012; Millán et al., 2013), as elaborated in the theory of self-determination (Ryan & Deci, 2000). However, peoples needs, fulfillment of needs, and satisfaction seem to differ from culture to culture around the world, likewise for entrepreneurs (Diener, Oishi, & Lucas, 2003; Schøtt & Liu, 2017).

The above considerations lead to the discernment of three gaps in our understating of the satisfaction related benefits of entrepreneurial endeavors. The first gap is our limited understanding of the aspects of entrepreneurship that benefit satisfaction. The second gap is our limited understanding of the dimensions of satisfaction benefits. The third gap is our limited understanding of the variation of benefits around the world.

To address the first gap, aspects of entrepreneurial endeavors, we focus on innovation. To address the second gap, dimensions of satisfaction, we examine three dimensions: satisfaction with job, satisfaction with balance between work and family, and satisfaction with life. To address the third gap, variation around the world, we compare China to the rest of the world.

Entrepreneurship is generally perceived of as a creative act involving opportunity identification, evaluation, and exploitation (Shane & Venkataraman, 2000). This creative act involves a high degree of self-determination, but not equally so for all entrepreneurs. In this paper we argue that self-determination increases with the innovativeness of entrepreneurs firms in terms of the novelty of production technologies, the extent to which no competitors offer similar products and services, and the extent to which potential customers perceive products or services to be new and unfamiliar (Schøtt & Jensen, 2016). Accordingly, and as based on arguments from self-determination theory (Ryan & Deci, 2000), we construct a theoretical model of how innovation promotes life-satisfaction among entrepreneurs by enhancing the conditions for the fulfillment of basic needs, partly as a direct effect and partly by increasing job satisfaction and work-life balance.

We extend this model with a particular focus on innovation as an important antecedent to the life satisfaction of Chinese entrepreneurs. The theory of life satisfaction argues that differences in the importance of values and goals across societies may cause differences in the strength by which autonomy, relatedness, and competence needs affect individuals life satisfaction (Diener et al., 2003). China in that respect provides an interesting case for several reasons. China is traditionally perceived of as a collectivistic society; thus life satisfaction would potentially be affected to a higher extent by the fulfillment of social needs and influenced less by self-esteem (Diener, Inglehart, & Tay, 2013; Lu, 1998). It is interesting to see whether these historically manifested cultural foundations (Bauer, 1976), in combination with recent developments in China towards a market economy, also make innovation a promoter of life-satisfaction for the new generation of Chinese entrepreneurs (Easterlin, Morgan, Switek, & Wang, 2012; Pan & Huang, 2012; Zhou & Xie, 2015).

These considerations frame our research question. *For entrepreneurs in China and elsewhere, how is their innovation affecting their job satisfaction, work-family balance, and life satisfaction?*

Answering this question contributes to understanding how innovation benefits satisfaction. First, a theoretical contribution is an application of the theory of self-determination to understanding how innovation can fulfill basic human needs and how this fulfillment promotes satisfaction. A second contribution is distinguishing among aspects of satisfaction and accounting for how they are intertwined with and differentially affected by innovation. A third contribution is to discern and interpret how the benefit of innovation for satisfaction differs across social contexts.

In the next sections we first provide a conceptual clarification of the relationships between the three constructs under the umbrella of subjective well-being, namely life satisfaction, job satisfaction, and work-life balance. We then turn to develop hypotheses concerning the impact of entrepreneurs innovativeness on their life satisfaction, job satisfaction, and work-life balance. We discuss these hypothesized relationships both globally and specifically for Chinese entrepreneurs. Using data from the Global Entrepreneurship Monitor, we then test our hypotheses, discuss the results, and conclude.

2. Theoretical background and hypotheses

The theory of self-determination (Ryan & Deci, 2000) states that individuals subjective well-being results from the fulfillment of three basic psychological needs: autonomy, competence, and relatedness. Subjective well-being (SWB) includes three separate components: positive affect, (absence of) negative affect, and life satisfaction (Diener, Emmons, Larsen, & Griffin, 1985). While the two former components refer to affective and emotional aspects of well-being, life satisfaction is a cognitive-judgmental component involving an assessment of individuals global judgment of their lives – as distinct from satisfaction within specific domains (Andrews and Whitney, 1976; Pavot & Diener, 1993). This conceptualization seems to apply to people around the world, including in China (Lu, 1998; Zhou & Xie, 2015). While we may think that causality also runs in the other direction, well-being causing greater fulfillment of needs, the theory of self-determination, and most other theorizing about well-being, considers need fulfillment as the cause of well-being.

Job satisfaction is, on the other hand, a construct that describes exactly the satisfaction that individuals may or may not have within a very specific domain: their job. It is thus not surprising that several studies have shown a positive relationship between job satisfaction and subjective well-being (and life satisfaction). The satisfaction with ones job may invoke both positive and negative affects as responses to immediate factors in ones work life, hence affecting the affective components of

SWB. Job satisfaction may, however, also reflect more long-term values and goals associated with ones current job, and hence involve cognitive-judgmental elements that affect the overall evaluation of life satisfaction. Conversely, it is not surprising either that reviews report some studies finding only little association between job satisfaction and life satisfaction. This would be the case if circumstances around individuals jobs do not constitute important elements in individuals evaluations of what is most important in their lives (Pavot & Diener, 1993). That entrepreneurs job-satisfaction has a beneficial effect on life-satisfaction, is thus not a hypothesis, but rather a proposition, that will here be reconfirmed as one of our starting points.

Work-life balance even more narrowly describes the satisfaction with the intersection between two domains: work life and non-work life. As documented in a review by Ergodan et al. (2012), role stressors and inter-role conflicts between the work and non-work domains may provide both affective responses and cognitive judgments of dissatisfaction, hence affecting SWB and life satisfaction. That entrepreneurs satisfaction with work-family balance is benefitting life-satisfaction, is a proposition that will here be reconfirmed as another of our starting points.

From this reasoning, elements of job satisfaction and work-life balance take part in sculpting individuals overall satisfaction with life (Greenhaus, Collins, & Shaw, 2003). They do so especially when the work domain and the intersection between the work and non-work domains provide for individuals fulfillment of their needs for autonomy, competence, and relatedness. The main argument that will be presented in more detail is that businesses that are innovative provide particularly good circumstances for entrepreneurs to fulfill such needs; hence innovative businesses provide positive impacts on entrepreneurs job satisfaction, work-life balance, and ultimately life satisfaction.

2.1. Job satisfaction

As described in a review by Huhtala and Parzefall (2007), innovativeness may on the one hand involve serious strains. The strains from participating in innovative work derives from the often complex, non-linear, and highly uncertain road to innovation outcomes. Frustration may arise from the pursuit of dead ends, lack of clarity, often conflicting and competing ideas and demands of people involved in the innovation process, and luring conflicts among stakeholders including co-workers (Janssen et al., 2004). On the other hand, however, several studies suggest that if the innovation process is properly organized, these strains may be overcome, and innovation work may instead invoke positive emotions and correspondingly enhance job satisfaction (Belias & Koustelios, 2014; Rasulzada & Dackert, 2009).

When the innovation process is properly organized, the very same organizing principles that facilitate innovation are quite consistent with those considered important for enhancing individuals job satisfaction. For example, in a study of job satisfaction in Taiwanese firms, Chang and Lee (2007) found that cultures and leadership styles that supported innovation and learning, and which supported the development of employees potential, also increased job-satisfaction among employees. Also, Huhtala and Parzefall (2007) emphasize the importance of autonomy, challenge, time, materials, and supportive social relationships for innovation. Most of these elements are also well reflected in the in the job-characteristics model of employee motivation (Hackman & Oldham, 1976). Following the job-characteristics model, the five job characteristics, autonomy, feedback, skill variety, task identity, and task significance, together produce psychological states that promote job satisfaction. Earlier findings have shown that occasions to be creative enhance the fulfillment of needs for self-actualization (Lawler & Hall, 1970). Also, a newer study by Delhey (2010) has found that job creativity is associated positively with life-satisfaction. Therefore, in stating our first hypothesis, we give emphasis to the positive impact of innovation on entrepreneurs job satisfaction,

H1. Innovation benefits job satisfaction.

2.2. Satisfaction with balance between work and family

One of the strains associated with working on innovation tasks is that the workload in both quantitative and qualitative terms may be considerably larger than for ordinary tasks (Janssen et al., 2004). Such high workloads may cause strain on an entrepreneur and put work-life balance under pressure. Notably, however, a high workload may not necessarily induce tensions and perceptions of stress for the entrepreneur as long as the entrepreneur perceives himself or herself to be in control of the innovation process (Karasek, 1979). Indeed, for their innovative work, entrepreneurs often possess both a high degree of skill discretion and a high decision authority, which are the two defining dimensions of job control.

Because work-life balance is not just a matter of the relative time spent in work and non-work environments, but also a result of cognitive evaluations of being in control of demands imposed from either of the two environments, the high degree of job control involved in innovative work may actually increase perceptions of work-life balance. As argued by Chiang, Birtch, and Kwan (2010), when job demands are perceived as high and not controllable, individuals often get physically as well as emotionally drained, which can result in negative spill-over effects into non-work environments such as the family. With the higher degree of flexibility, autonomy, and job control that are associated with innovative work, such physical and emotional drains, as well as their negative spill-over effects are less likely to occur. Thus, compared to non-innovative entrepreneurs, more innovative entrepreneurs can be hypothesized to experience a higher work-life balance. In accordance with these considerations, we state our second hypothesis,

H2. Innovation benefits satisfaction with work-family balance.

2.3. Satisfaction with life

In several ways there is a considerable conceptual overlap in the models that we have used to predict the impact of innovation on job satisfaction (the Job Characteristics model; Hackman & Oldham, 1976) work-life balance (the Demand-Control stress model; Karasek, 1979) and the self-determination theory (Deci and Ryan, 2000). In particular, the needs for autonomy and competence, but also the need for relatedness, are prominent in all three models. As we have described above, the performance of innovative tasks is likely to promote more positive interpretations of autonomy and mastery, and hence promote self-actualization. So, we can expect positive evaluations from innovative entrepreneurs regarding their jobs, and the intersection (balance) between work and non-work environments, to contribute to positive perceptions of their quality of life (Blanchflower & Oswald, 2011, 2011; Millán et al., 2013).

The question is, whether we can also expect a direct effect from innovation on entrepreneurs life satisfaction when we at the same time consider the mediating effects of job satisfaction and work-life balance; that is, whether the impact from innovation on entrepreneurs life satisfaction is only partly, rather than fully, mediated by job satisfaction and work-life balance.

When addressing this question, it is important to notice that an individuals cognitive evaluations of the quality of life concern more than just the work domain, and they concern other aspects of the inter-action between the work and non-work domains than merely evaluations of balance and the consequences thereof. In particular the evaluations of social relationships in different social spheres, such as in the family or friendship spheres, provide important information for individuals cognitive evaluations of life (Pavot & Diener, 2008). Evaluations may thus involve considerations of competence in such spheres, perceptions of being liked, recognized, and respected, but also involve being able to contribute to the well-being of others, etc.

Exactly such individual level outcomes have been emphasized as resulting from participating in innovative work, and as promoting the life-satisfaction of innovative entrepreneurs. Indeed, creative people often feel more enthusiastic and optimistic, which is known to spill over, positively, into their social life. Also, because innovation involves the implementation of ideas that are useful and beneficial for others such as for customers and potentially for society as a whole (Ford, 1996), there is often a personal satisfaction in providing innovative services and products (West & Anderson, 1996). Thus, it seems reasonable to think that entrepreneurs satisfaction from innovativeness spills over from the work domain into a wide range of non-work domains, providing conditions that entrepreneurs perceive as need fulfilling and as enhancing their life satisfaction. We express this as our third hypothesis,

H3. Innovation benefits satisfaction with life.

2.4. Innovation, job satisfaction, work-family balance, and life satisfaction in China

Peoples well-being differs around the world (Diener & Diener, 1995). Entrepreneurs well-being also differs across locations (Schott & Liu, 2017). Well-being tends to be higher in wealthy societies than in poor societies (apart from the positive effect, for individuals, upon well-being from personal income). For several years, now almost proverbially, the happiest country has been Denmark. China has a long history of concern with happiness (Bauer, 1976), and recent changes in institutions in China have entailed changes in life-satisfaction for Chinese people. Therefore, China is expectedly an interesting setting for examining satisfaction, especially among people whose roles have changed dramatically, such as entrepreneurs. Cross-national differences in well-being are not our concern here. Our focus is on the effect of innovation on well-being, so our question is whether the effects of innovation differ across societies. Our expectation is that the effects in China differ from effects elsewhere.

In China, the role of the entrepreneur and the function of innovation have changed dramatically over recent decades. This has been evident in the increasing focus on entrepreneurship and innovation in the political transformations to support a movement towards a market economy (Chen & Naughton, 2016). The change is also expressed in the recent policy initiative for Mass entrepreneurship and mass innovation. This institutional transformation has been associated with higher recognition of innovative entrepreneurs. It has also been associated with higher opportunities for the Chinese to pursue self-actualization through entrepreneurship and through innovative work (Lewin, Välikangas, & Chen, 2017).

Recent studies by Brockman et al. (2009) have found that the dramatic societal transition in China has afforded a general decline in the overall happiness of the Chinese population. Their findings further suggest that this decrease in the overall happiness level in China is partly caused by higher levels of economic inequality. This implies that succeeding in business, and especially in making above normal returns from business, may be particularly important for Chinese entrepreneurs. Because innovative businesses are more likely to generate such extraordinary profits, we contend that innovativeness is likely to be even more important for Chinese entrepreneurs than for entrepreneurs around the world.

This Chinese emphasis on innovation suggests that Chinese entrepreneurs consider innovative work especially meaningful, even more than entrepreneurs elsewhere do. It also suggests that Chinese entrepreneurs derive an income from innovative work, which is especially high, even higher than entrepreneurs elsewhere do. Therefore, we expect that Chinese entrepreneurs have especially high satisfaction from innovative work, even more than entrepreneurs elsewhere have, so we hypothesize an enhancing moderating effect,

H4. Innovation promotes more job satisfaction for entrepreneurs in China.

Several studies have argued that the economic, social, and political institutions in China have distinctive effects on how work life balance is experienced by Chinese workers and entrepreneurs. Marketization has been accompanied by a work intensification and a growth in weekly working hours in the private sector. At the same time, political reforms have prioritized economic development over issues of work life imbalances (Xiao & Cooke, 2012). Such developments would normally be associated with decreasing levels of work life balance.

In the case of China, however, there are also social dynamics that seem to alleviate the increased pressures on individuals from their work domains. Notably, the cultural Confucian heritage emphasizes the value of hard work and personal sacrifice. Also, the collectivistic Chinese culture, to a higher extent than the typically more individualistic western cultures, tends to have a higher integration of the family and work spheres. For these reasons, higher dedication to the work domain may not to the same extent be perceived as involving compromises of family responsibilities (Choi, 2008). Some studies have even alluded that because the increased marketization has opened for better opportunities to achieve higher living standards, and has sparked desires for achieving financial and material rewards, working long hours to provide for the family may not be perceived of as conflicting with overall family interests (Chandra, 2012; Xiao & Cooke, 2012).

The question is, if these particular circumstances for China cause innovativeness to be more or less important for Chinese entrepreneurs in alleviating work life imbalances. At first, it can be argued that the increased flexibility, autonomy, and job control, which is associated with innovative work, play a smaller role for Chinese entrepreneurs work life balance. This may be so because work ethics and higher integration of the work and family spheres impose less pressures on the entrepreneur for physically spending time with the family. On the other hand, it can also be argued that innovative Chinese entrepreneurs with above normal profits are more capable of commercializing their household responsibilities and thereby reducing work-family conflicts (Chandra, 2012). These opposing mechanisms make it hard to predict whether innovation affects work-family balance differently in China than elsewhere. So, without stating a direction, we may cautiously think,

H5. Innovation affects work-life balance differently for entrepreneurs in China.

Cross-national studies of life satisfaction have argued that although the fulfillment of basic human needs is central to explaining individuals life satisfaction, cultural differences may cause differences in the strength by which the fulfillment of specific needs affect life satisfaction (Diener & Diener, 1995). Especially, it has been argued that needs for autonomy, self-esteem, and competence are more important for individuals life satisfaction in individualistic cultures, while the need for relatedness is more important in collectivistic cultures (Diener et al., 2015). From these studies, we may initially perceive of autonomy and competence, as enacted by innovative entrepreneurs, as being less influential on entrepreneurs life satisfaction in a Chinese context. Conversely, we may also argue that the low uncertainty avoidance, which similarly characterizes Chinese culture, is expressive of a high tolerance for uncertainty and ambiguity, which signify that Chinese entrepreneurs may derive more positive psychological outcomes from participating in innovative activities (Hofstede, 1984). Moreover, Hofstede (1984) also found that low uncertainty avoidance correlated highly with a high need for achievement.

Given the low uncertainty avoidance in China, and further enhanced by the strong emphasis on innovation in China, we conjecture that innovation brings Chinese entrepreneurs especially strong feelings of success as well as especially high social esteem and prestige, more than innovation brings entrepreneurs elsewhere. Moreover, recent findings suggest that the economic liberalization in China has increased the importance of financial satisfaction for life satisfaction (Brockmann, Delhey, Welzel, & Yuan, 2009). Accordingly, the above normal profits, which may be derived from innovation, are likely to be especially promotive of Chinese entrepreneurs life satisfaction. These arguments lead us to hypothesize an amplifying moderating effect:

H6. Innovation promotes more life satisfaction for entrepreneurs in China.

The six hypotheses, and also the two propositions about effects of satisfaction in specific domains (discussed at the beginning of this section), are represented in the causal model in Fig. 1.

The six hypotheses and two propositions are tested in the following. The effect of innovation upon life-satisfaction is expectedly partly the result of job-satisfaction and work-family balance, so we ascertain significance and magnitude of the mediation of the effect of innovation through job-satisfaction and work-family balance upon life-satisfaction.

3. Research design and data

The population is a population of entrepreneurs. We study a population of entrepreneurs around the world, and also a population of entrepreneurs in China. The population of entrepreneurs around the world is surveyed in the Global Entrepreneurship Monitor (GEM), which conducts an annual survey of the worlds adults, and thereby identifies entrepreneurs (Bosma, 2013; Global Entrepreneurship Research Association, 2017). The survey asked about satisfaction in 2013 and 2014 (Amorós & Bosma, 2014).

3.1. Sampling

The GEM uses two stage sampling. First countries are sampled, essentially by self-selection. Questions about satisfaction were included in the survey in 2013 and 2014 in 68 countries, namely Algeria, Angola, Argentina, Bosnia and Herzegovina,

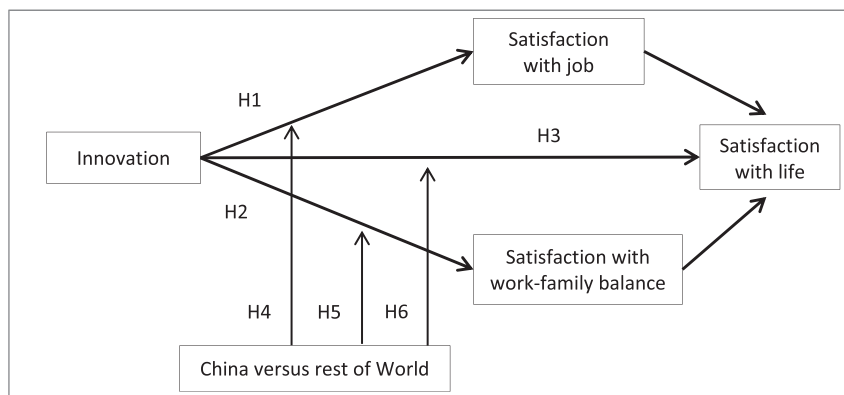


Fig. 1. Hypothesized effects among innovation and satisfaction.

Barbados, Belgium, Brazil, Botswana, Canada, Chile, China, Colombia, Croatia, the Czech Republic, Ecuador, Estonia, Finland, France, Germany, Ghana, Greece, Guatemala, Hungary, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Latvia, Libya, Lithuania, Luxemburg, Macedonia, Malaysia, Mexico, Namibia, the Netherlands, Nigeria, Norway, Panama, Peru, the Philippines, Poland, Portugal, Puerto Rico, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Suriname, Sweden, Switzerland, Taiwan, Thailand, Trinidad and Tobago, Turkey, the United Kingdom, the United States, Uruguay, Vietnam, and Zambia. This set of diverse countries has a rather high degree of representativeness of the countries around the world.

The second stage is a fairly random sampling of adults within each country. The representativeness in the two stages of sampling implies a representativeness of the sampled adults, and thus also of the identified entrepreneurs, enabling the findings to be generalized to the worlds entrepreneurs. The sampling yielded 33,519 entrepreneurs who own and manage a starting or operating business. The subsample in mainland China is 786 entrepreneurs, surveyed in 2013.

3.2. Measurements

This section describes the measurement of the variables of interest and the control variables.

3.2.1. Satisfaction with life

Life-satisfaction is measured with the questions from the Satisfaction with Life Scale (SWLS) used in previous surveys (Pavot & Diener, 2008). Life-satisfaction of an adult is measured by asking for extent of agreement with several statements,

- In most ways, my life is close to my ideal.
- The conditions of my life are excellent.
- I am satisfied with my life.
- So far, I have obtained the important things I want in life.
- If I could live my life again, I would not change anything.

For each statement, agreement is measured on a five-point Likert scale, which is standardized across the sample of respondents. The five are positively correlated, with Cronbach alpha .82, and an exploratory factor analysis reveals a single factor, so they can be combined into an index of life-satisfaction. This measure of life-satisfaction is also being used in studies of entrepreneurs (Schött & Liu, 2017).

3.2.2. Satisfaction with balance between work and family

Satisfaction with work-family balance is measured with questions adapted from a previous survey (Valcour, 2007). Work-family balance of an adult, who is self-employed or an employee, is measured by asking for extent of agreement with several statements,

- I am satisfied with the way my time is divided between work and private life.
- I am satisfied with my ability to balance the needs of my work with those of my personal or family life.
- I am satisfied with the opportunity to perform well at work and to substantially contribute to home-related responsibilities at the same time.

For each statement, agreement is measured on a five-point Likert scale, which is standardized across the sample of respondents. The three are positively correlated, with Cronbach alpha .83, and an exploratory factor analysis reveals a single factor, so the three variables can be combined into an index of satisfaction with work-family balance.

3.2.3. *Job satisfaction*

Job satisfaction is measured with questions adapted from previous surveys (Blustein, 2008; Spreitzer, Kizilos, & Nason, 1997). Job satisfaction of an adult, who is self-employed or a full-time or part-time employee, is measured by asking for extent of agreement with several statements,

- I can decide on my own how I go about doing my work.
- The work I do is meaningful to me.
- At my work, I am not exposed to excessive stress.
- I am satisfied with my current work.
- I am satisfied with my current income from work.

For each statement, agreement is measured on a five-point Likert scale, which is standardized across the sample of respondents. The five are positively correlated, with Cronbach alpha .70, and an exploratory factor analysis shows a single factor, so they can be combined into an index of job-satisfaction.

3.2.4. *Innovation*

Innovation was measured by asking the entrepreneurs starting a business (with similar wording for those running a business),

- Have the technologies or procedures required for this product or service been available for less than a year, or between one to five years, or longer than five years?
- Will all, some, or none of your potential customers consider this product or service new and unfamiliar?
- Right now, are there many, few, or no other businesses offering the same products or services to your potential customers?

Each response was coded on a scale from 1 to 3 for increasing innovativeness. The variables correlate positively (Cronbach alpha = .36), and an exploratory factor analysis reveals a clear single factor, so they are combined, averaged, into an index of innovation, going from 0 to 3 (because the variables are not highly correlated, the index is formative rather than reflective). This index has been used in many earlier studies, including in China (Hovne, Hovne, & Schøtt, 2014; Jensen & Schøtt, 2014).

3.2.5. *Control variables*

The analysis should control for conditions related to innovation and affecting well-being. The control variables with their coding are (Bosma, 2013):

- Gender, which is coded 0 for men and 1 for women;
- Age, which is measured in years, and runs between 18 and 64;
- Education, which is here coded in years;
- Income, which is here classified as the lowest third, middle third, and highest third of household income for the sampled adults within each country, and is coded 1, 2 and 3, respectively;
- Household denotes number of people living together, and is logged to reduce skew;
- Motive for starting, which is either starting because of seeing an opportunity or because of the necessity to make a living and seeing upstart as the best option, is coded 0 for necessity and 1 for opportunity;
- Phase refers to the starting phase versus the operating phase, and is here coded 0 and 1, respectively;
- Owners denote number of persons who own and manage the business, and is here logged to reduce skew;
- Firm age is counted in years, and is here logged to reduce skew;
- Firm size is measured by number of persons working for the business, and is logged to reduce skew;
- The analysis of satisfaction around the world will control for national wealth, Gross National Income per capita (measured in purchasing power parity), which here is logged to reduce skew.

3.3. *Technique for analysis*

The variables are mostly based on the interviews from the Global Entrepreneurship Monitor, so there might be a common source bias. Whether such as bias exists is examined by the Harman's single factor test of common source bias. An exploratory factor analysis with a single factor of the responses that are directional shows that the first factor only explains 17% of the variance. This is so low as to indicate that there is no problem of common method bias.

The data on entrepreneurs around the world are hierarchical, entrepreneurs nested within countries, and individuals satisfaction is influenced by their innovation and their context, notably the wealth of their country. This is analyzed by

hierarchical linear regression (also called hierarchical linear modeling). This is similar to linear regression but also takes into account the context (Snijders & Bosker, 2012). All variables are standardized, so as to yield standardized coefficients that are comparable. Moreover, for the global analysis, the independent variables are centered within each country.

Mediation of the effect of innovation through job-satisfaction and work-family balance upon life-satisfaction is tested using Sobels z-test, and the magnitude of mediation effects is estimated using techniques from path analysis in causal models (Hayes, 2013).

4. Results

This section provides, first, a description of the sample of entrepreneurs in the World and the subsample of entrepreneurs in China.

4.1. Description of the sample

The sample is described by distributions and associations of variables, Table 1.

The means, standard deviations, and correlations of variables around the world are rather similar to those in China. The correlations among the three dimensions of satisfaction are all positive and moderately strong (between .42 and .76), so it is appropriate to analyze how each is affected by innovation. Each dimension of satisfaction is positively but weakly correlated with innovation, as we should expect.

Table 1
Means, standard deviations, and correlations.

World	Min	Max	Mean	Standard deviation	Satisfaction with life	Satisfaction with job	Satisfaction with balance
Satisfaction with life	1	5	3.5	.95			
Satisfaction with job	1	5	3.8	.79	.54 ****		
Satisfaction with balance	1	5	3.8	1.01	.42 ****	.58 ****	
Innovation	1	3	1.5	.47	.07 ****	.08 ****	.06 ****
Gender: female	0	1	.39	.49	-.03 ****	-.04 ****	.02 **
Age	18	64	39.4	11.5	.07 ****	.07 ****	.06 ****
Education	0	19	11.4	4.3	.11 ****	.03 ****	-.04 ****
Income	1	3	2.1	.83	.14 ****	.05 ****	-.03 ****
Household, logged	0	4	1.3	.51	-.03 ****	-.01 **	.02 **
Motive: opportunity	0	1	.58	.49	.16 ****	.10 ****	.08 ****
Phase: operating	0	1	.66	.47	.03 ****	.06 ****	.01 *
Owners, logged	0	3.0	.32	.51	.02 ****	-.02 **	-.02 **
Firm-age, logged	0	5.4	1.2	1.2	.04 ****	.04 ****	.01
Firm-size, logged	0	7.6	.68	.94	.09 ****	.09 ****	.00
Sector: extractive	0	1	.06	.24	-.03 ****	.00	.03 ****
Sector: manufacture	0	1	.26	.44	.02 ****	.04 ****	.02 **
Sector: business services	0	1	.14	.35	.06 ****	.02 **	-.02 **
Sector: consumer services	0	1	.54	.50	-.04 ****	-.05 ****	-.01 **
Gross National Income, log	.23	3.9	2.3	.88	.21 ****	.12 ****	.01
China	Min	Max	Mean	Standard deviation	Satisfaction with life	Satisfaction with job	Satisfaction with balance
Satisfaction with life	1	5	3.2	.81			
Satisfaction with job	1	5	3.5	.66	.59 ****		
Satisfaction with balance	1	5	3.5	.76	.50 ****	.62 ****	
Innovation	1	3	1.5	.40	.10 **	.03	.03
Gender: female	0	1	.49	.50	.00	-.02	.00
Age	18	64	37.5	9.9	.07 *	.10 **	.14 ****
Education	0	19	11.0	3.2	.01	-.01	-.08 **
Income	1	3	2.2	.81	.10 **	.00	-.04
Household	0	2.3	1.3	.33	.00	.02	-.02
Motive: opportunity	0	1	.40	.49	.07 *	.08 ***	.00
Phase: operating	0	1	.82	.39	.10 **	.16 ****	.10 **
Owners	0	3.0	.26	.49	-.06 *	-.08 **	.03
Firm-age	0	3.7	1.3	1.0	.13 ****	.17 ****	.11 **
Firm-size	0	4.6	1.0	.87	.11 **	.13 ****	.09 **
Sector: extractive	0	1	.02	.13	-.05	-.03	.00
Sector: manufacture	0	1	.12	.32	-.01	.02	-.02
Sector: business services	0	1	.06	.24	.00	-.01	-.01
Sector: consumer services	0	1	.80	.40	.02	.00	.02

*p < .10 **p < .05 ***p < .005 ****p < .0005.

The variables of interest have correlations with the control variables that are all weak (magnitude less than .21), indicating that there will not be any problem of multicollinearity in the analyses. Furthermore, all Variance Inflation Factors (VIFs) in the regression are less than 3, also indicating that multicollinearity is not an issue.

4.2. Effects of innovation on satisfaction

The starting points were that life-satisfaction is positively affected by job-satisfaction and satisfaction with the balance between work and family, as considered at the beginning of section 2. These two propositions can be reconfirmed by a linear model of life-satisfaction affected by job-satisfaction and work-life balance, for the entrepreneurs around the world, [Table 2](#),

Table 2
Satisfaction affected by innovation; in the world and in China.

World	Satisfaction with job	Satisfaction with balance	Satisfaction with life	
			Without mediators	With mediators
Satisfaction with job				.364 ***
Satisfaction with balance				.177 ***
Innovation	.058 ****	.040 ****	.065 ****	.037 ****
Gender female	.005	.022 ***	.016 **	.011 *
Age	.036 ****	.051 ****	.020 ***	-.003
Education	-.020 **	-.027 ***	.024 ***	.036 ****
Income	.081 ****	.038 ***	.112 ***	.076 ***
Household	-.006	-.002	.010	.013 **
Motive opportunity	.078 ****	.060 ****	.102 ****	.063 ****
Phase operating	.065 ****	.031 ***	-.018 *	-.046 ****
Owners	-.026 ****	-.006	-.013 **	-.003
Firm-age	-.001	.001	.041 ****	.039 ****
Firm-size	.040 ****	-.003	.067 ****	.054 ****
Sector extractive	.003	.014 **	-.010 *	-.013 **
Sector manufacture	-.005	.009	-.005	-.006
Sector business services	-.005	.005	.012 *	.013 **
Gross National Income per capita	.043	-.066	.133 **	.134 ***
Constant	-.047	-.027	-.043	-.039
Country * Year	Yes	Yes	Yes	Yes
N Country * Years	60	58	58	58
N countries	59	57	57	57
N years	2	2	2	2
N entrepreneurs	23,863	22,395	22,089	22,066
China	Satisfaction with work	Satisfaction with balance	Satisfaction with life	
			Without mediators	With mediators
Satisfaction with work				.433 ***
Satisfaction with balance				.231 ***
Innovation	.035	.048 *	.106 ***	.092 ***
Gender female	.006	.009	.016	.010
Age	.057	.117 ***	.052	.009
Education	.026	-.054	-.005	.001
Income	-.008	-.007	.099 **	.091 ***
House hold	.021	-.016	.009	.008
Motive opportunity	.087 **	.011	.066	.034
Phase operating	.054	.037	-.016	-.054
Owners	-.059	.073	-.037	-.042
Firm-age	.118 **	.035	.128 **	.065
Firm-size	.056	.058	.064	.031
Sector Extraction	-.019	-.011	-.038	-.028
Sector Manufacture	-.001	-.031	-.029	-.018
Sector Business services	.013	-.010	.012	.007
N entrepreneurs	769	768	768	768

Hierarchical linear modeling (taking country and year into account).

Each variable is standardized.

Each independent variable is centered within country.

*p < .10 **p < .05 ***p < .005 ****p < .0005.

Linear regression.

Each variable is standardized.

*p < .10 **p < .05 ***p < .005 ****p < .0005.

last model in the top panel (a hierarchical model with entrepreneurs nested within countries, as described in subsection 3.3). The positive effect of job-satisfaction upon life-satisfaction is indicated by the coefficient .364 ($p < .0005$). The effect of work-life balance is revealed by the coefficient .177 ($p < .0005$). These standardized coefficients are quite large, showing that the effects are quite large, as expected.

Innovation was hypothesized to benefit well-being, specifically job satisfaction (Hypothesis 1), satisfaction with balance between work and family (Hypothesis 2), and satisfaction with life (Hypothesis 3). These hypotheses are also tested by the linear models in Table 2.

For the entrepreneurs around the world, in the upper panel of Table 2, innovation has a positive effect on satisfaction with job, thus supporting Hypothesis 1; with a notable magnitude as indicated by the standardized coefficient .058 ($p < .0005$). Likewise, innovation positively affects work-life balance, supporting Hypothesis 2; with a rather notable effect size as shown by the standardized coefficient .040 ($p < .0005$).

Innovation also positively affects life-satisfaction, supporting Hypothesis 3. The total effect (without the mediators) is substantial as indicated by the standardized coefficient .065 ($p < .0005$), listed in the third model in the top panel of Table 2 (Hayes, 2013; Ch.5). When the mediators are included the coefficient is reduced to about half, .037 ($p < .0005$), listed in the last model in the top panel of Table 2. The indirect effect through job-satisfaction is estimated as .021 (namely $.058 \times .364$), which is highly significant (Sobel's test yields $z = 9.1$ and $p < .0005$). The indirect effect through work-life balance is .007 (namely $.040 \times .177$), which is highly significant (Sobel's test has $z = 5.8$ and $p < .0005$). The total effect of .065 is thus the sum of the indirect effect .021, indirect effect .007, and direct effect .037. In other words, the effect of innovation upon life-satisfaction is partly direct (slightly more than half of the total effect) and partly mediated (slightly less than half of the total effect), mainly through job-satisfaction and less through work-life balance.

The hypotheses may also be tested specifically for the entrepreneurs in China, similarly by linear modeling, shown in the lower panel in Table 2. Hypothesis 1, that job-satisfaction is positively affected by innovation, is tested by the coefficient in the first model in the lower panel. The coefficient is not statistically significant, .035 ($p = .15$ one-tailed), thus not supporting Hypothesis 1 when tested for the modest-sized sample in China.

Hypothesis 2, that satisfaction with work-family balance is positively affected by innovation, is tested by the coefficient in the second model in the lower panel. The positive coefficient .048 ($p = .09$ one-tailed) supports Hypothesis 2 for the entrepreneurs in China. The standardized coefficient .048 is a notable effect, and is similar to the effect estimated for the world, .040.

Hypothesis 3, that life-satisfaction is positively affected by innovation, is tested in the last two models. The total effect (without mediators) is estimated as .106 ($p = .0013$), and the direct effect is estimated as .092 ($p = .0007$), supporting Hypothesis 3 for the entrepreneurs in China. Both the total and direct effects are substantial. The indirect effect, through the two mediators, is estimated as tiny, .014 (namely $.106 - .092$). Indeed, the indirect effect through job-satisfaction is estimated as tiny and is not statistically significant (Sobel's test has $z = .6$ and p far larger than .10). Also, the indirect effect through work-family balance is estimated as tiny and is not statistically significant (Sobel's test has $z = .7$ and p much larger than .10). Thus, for the entrepreneurs in China, the evidence shows that innovation benefits satisfaction, especially life-satisfaction, but tells little about mediation of the effect.

In short, for entrepreneurs around the world and specifically in China, innovation tends to promote satisfaction.

4.3. Effects in China contrasted the rest of the world

We can explore whether the effects of innovation on satisfaction are the same or different between China and the rest of the world. This question is addressed by forming a dummy variable for China versus the rest of the world to see, first, whether level of satisfaction differs between China and the rest of the world as a main effect, by using this dummy as an additional variable. This main effect is estimated in the hierarchical linear model in Table 3, where the dummy and GNI per capita are macro-level variables, and all other variables are at the individual level.

The main effect of being in China (rather than being elsewhere in the world) upon satisfaction with job is not significant. Likewise, the main effect of being in China rather than elsewhere upon satisfaction with balance is not significant. Also, the main effect of being in China rather than elsewhere upon satisfaction with life is not significant. In short, the level of satisfaction does not differ discernably between China and the other countries (these non-results are not surprising because the number of cases (here countries) is modest).

Hypothesis 4, that the effect of innovation upon job satisfaction differs between China and the rest of the World, is tested by including the interaction, the product of the dummy with innovation, in the model predicting job satisfaction, the first model in Table 3. The interaction effect upon job satisfaction is not significant, $-.034$ ($p = .39$). Therefore, the effect of innovation on job satisfaction is not discernibly different between China and the rest of the world, and Hypothesis 4 is not supported.

Hypothesis 5, that the effect of innovation upon work-family balance differs between China and the rest of the world, is tested by including the interaction in the model of work-family balance, Table 3. The interaction effect upon work-family balance is not significant, $-.014$ ($p = .72$). Therefore, the effect of innovation on satisfaction with balance is not significantly different between China and the rest of the world, thus lending no support for Hypothesis 5.

Hypothesis 6, that the effect of innovation upon life satisfaction is higher in China than elsewhere, is tested by including the interaction in the model of life satisfaction, the last model in Table 3. The interaction effect upon life satisfaction is

Table 3

Effects of innovation on satisfaction, in China contrasted with the rest of the world.

	Satisfaction with job		Satisfaction with balance		Satisfaction with life	
	Main effects	Interaction effect	Main effects	Interaction effect	Main effects	Interaction effect
Satisfaction with job					.364 ****	.364 ****
Satisfaction with balance					.177 ****	.177 ****
China vs Rest	-.404	-.404 §	-.250	-.250 §	-.187	-.187 §
Innovation	.058 ****	.058 §	.040 ****	.041 §	.037 ****	.035 §
Innovation * China vs Rest		-.034		-.014		.059 *
Gender female	.005	.005	.022 ***	.022 ***	.011 **	.011 **
Age	.036 ****	.036 ****	.051 ****	.051 ****	-.003	-.003
Education	-.020 **	-.020 **	-.027 ***	-.027 ***	.036 ****	.036 ****
Income	.081 ****	.081 ****	.038 ****	.038 ****	.076 ****	.076 ****
Household	-.006	-.006	-.002	-.002	.013 **	.013 **
Motive opportunity	.078 ****	.078 ****	.060 ****	.060 ****	.063 ****	.063 ****
Phase operating	.065 ****	.065 ****	.031 ***	.031 ***	-.046 ****	-.047 ****
Owners	-.026 ****	-.027 ****	-.006	-.006	-.003	-.003
Firm-age	-.001	-.001	.001	.001	.039 ****	.039 ****
Firm-size	.040 ****	.040 ****	-.003	-.003	.054 ****	.054 ****
Sector extractive	.003	.003	.014 **	.014 **	-.013 **	-.013 **
Sector manufacture	-.005	-.005	.009	.009	-.006	-.006
Sector business services	-.005	-.005	.005	.005	.013 **	.013 **
Gross National Income per capita	.038	.038	-.069	-.069	.134 **	.132 **
Country * Year	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-.039	-.039	-.022	-.022	-.039	-.036
N Country * Years	60	60	58	58	58	58
N countries	59		57		57	
N years	2		2		2	
N entrepreneurs	23,863		22,395		22,066	

Hierarchical linear modeling (taking into account both country and year).

Each variable is standardized.

Each independent variable is centered within country.

§ Significance not tested (is tested in model of main effects).

*p < .10 **p < .05 ***p < .005 ****p < .0005.

significant, .059 ($p = .04$), supporting [Hypothesis 6](#). Therefore, the effect of innovation upon life satisfaction is higher in China than in the rest of the world, as expected. Thus, innovation has greater benefit for life satisfaction in China than it has in the rest of the world.

In short, there is support for the hypothesis of a larger direct impact of innovation on life satisfaction for entrepreneurs in China, while at the same time no support for different mediating impacts through job satisfaction and work-family balance. Our results are consistent with the finding by [Brockman et al. \(2009\)](#) that the potential economic rents from innovation may play an especially prominent role for Chinese entrepreneurs life satisfaction.

5. Conclusions

The research question was, *for entrepreneurs in China and elsewhere, how is their innovation affecting their job satisfaction, work-family balance, and life satisfaction?* This concluding section considers, first, the findings, and then the contributions, limitations, and further research.

5.1. Summary of findings

Entrepreneurs innovation benefits their life satisfaction considerably, both directly and indirectly, with beneficial effects mediated by job satisfaction and satisfaction with work-family balance. These effects were evident for the entrepreneurs around the world. In China, the effect upon life-satisfaction was also evident, but indirect effects through satisfaction with job and with work-family balance were less discernible in China, where the sample size was modest. Contrasting China to the rest of the world, innovation was found to carry greater benefit for entrepreneurs life satisfaction in China.

5.2. Contributions

These findings contribute to understanding how innovation benefits satisfaction. First, a theoretical contribution is an application of the theory of self-determination to understanding how innovation can fulfill basic human needs and how this fulfillment promotes satisfaction. Thinking about innovation as expressing competence and some autonomy, the findings show that this competence and autonomy enhances well-being. Competence and autonomy are theorized in the social

psychological theory of self-determination to be fundamental human needs that, when fulfilled, enhance well-being. Our findings thus lend further support for the theory of self-determination and an application thereof. Innovation brings not only a financial benefit in form of business profit, but also a non-pecuniary benefit in form of well-being.

A second contribution is distinguishing among aspects of satisfaction and accounting for how they are intertwined with and differentially affected by innovation. Entrepreneurs life satisfaction is greatly promoted by their job satisfaction and satisfaction with the balance between work and family. Innovation promotes life satisfaction directly and indirectly, by promoting both job-satisfaction and satisfaction with work-family balance. That innovation promotes all aspects of satisfaction is indicative of the diverse non-pecuniary benefits of innovation.

A third contribution is to discern and interpret how the benefit of innovation for satisfaction differs across social contexts. That innovation benefits life satisfaction more in China than elsewhere can be explained by the recent steep increases in the esteem granted entrepreneurs and in the value accorded innovation in China.

5.3. Limitations

The analysis was conducted at the micro-level of individuals or entrepreneurs who may innovate and gain satisfaction. The only macro-level condition that was included in the analysis was wealth of the country, and this was included merely as a control variable. A major limitation is the lack of systematic analysis of institutions in society which influence the link between innovation and well-being. Finding considerable difference between China and the rest of the world calls for a systematic analysis of macro-level conditions.

5.4. Further research

The benefit of innovation for well-being may be contextualized by considering how cultural and social institutions in society are moderating the benefit (Litsareva, 2017; To, 2017; Zeng, 2017), including in China (Zhou & Xie, 2015). Innovation is highly appreciated in some societies and less valued in other societies. The value that a society grants to innovation may influence the well-being emerging from innovation. A hypothesis is that the value attached to innovation in society will boost the benefit of innovation for well-being. Innovation and its benefits can thus be analyzed globally in the context of national societies, and can be analyzed in China in the context of provinces (Su, Zhai, & Landström, 2015).

Conflicts of interest

The authors declare no conflict of interest.

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